

Regional development of free trade areas in the context of the tax incentive policy of the Manaus free trade zone – Amazonas, Brazil

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Abstract— The research brings in its scope the need to analyze the socioeconomic development of the municipalities of Tabatinga (Amazonas), Guajará-Mirim (Rondônia), Boa Vista and Bonfim (Roraima), Macapá and Santana (Amapá) and Brasiléia (Acre), with extension for the municipality of Epitaciolândia, and Cruzeiro do Sul (Acre), which are subject to the fiscal incentive policy, in the form of Free Trade Areas, linked to the Superintendence of the Manaus Free Trade Zone - SUFRAMA. The general objective of the research was to analyze the regional development of the nine cities covered by the SUFRAMA policy in comparison with other nine Amazonian municipalities not covered by this policy, in order to identify the municipal performances achieved in the face of the Brazilian Amazonian reality. The research method used was hypothetical-deductive. The research data were submitted to the multivariate factor model to extract the scores for the construction of the indices, using the SPSS statistical tool, version 22. The data were submitted to the necessary requirements for the sieve of

factorial studies, through the tests of Bartlett's sphericity and the adequacy of the Kaiser-Meyer-Olkin (KMO) sample. In this way, it was possible to build socioeconomic development indexes and, with that, proceed with the due analysis intrinsic to the epistemological question of this work. The data showed adequacy to factor studies and allowed us to observe, in general, the low level of socioeconomic development of the surveyed municipalities, however, with a more favorable situation for the municipalities covered by the SUFRAMA policy.

I. INTRODUCTION

Understanding the Amazon and its multiple interrelationships requires objectivity and clarity that permeates the logic of delimiting the theme, space and temporality in which the phenomena to be observed can be seen and analyzed within a rational and scientific construction. Thus, the theme of regional development, from the perspective of economic and social development, within the context of free trade areas linked to the Manaus Free Trade Zone (SUFRAMA) policy, allows us to understand aspects of the Amazonian reality, its multiple forms and identities that portray the regional challenges in promoting actions aimed at institutional strengthening and their own trajectory resulting from choices and decision-making under the aegis of collective or even institutional behavior, from public policies directed to the region.

The Amazon development challenge is not new. Its socio-environmental complexity has always been the scene of discussions and often seen as an obstacle under the more orthodox logic of economic growth, where more conventional models, such as agricultural production, especially in the 1960s, 1970s and 1980s, were driven by colonization. Agriculture in some regions of northern Brazil, such as Pará and Rondônia, allowed the rapid process of consolidation of these activities as a standardized style of development marked by agricultural culture. On the other hand, the immense Amazon biome and the need to preserve these natural environments allowed us to think of more heterodox forms of development and for such models to take into account perspectives and values based on aspects of sustainable development, a vision that is institutionalized worldwide, the from the Brundtland Report or Our Common Future Report, which served as the basis for the second UN Conference on environment and development, held in Rio de Janeiro, in 1992. In this sense, it is worth highlighting the observations brought by José Eli da Veiga when pointing to the difficult measurement of sustainable development, when signaling that it is not a concept, as much as social justice, but a utopian expression that is here to stay [1].

According to the same author, GDP per capita has always been used as an indicator of economic growth, signaling a scenario whose interpretation points to the economic strength of a region, of a country, for example, where the term “development” has been used for a long time, was closely identified only with economic growth. When trying to illustrate this situation in a more routine and empirical way, José Eli da Veiga quotes Cambridge professor, economist Joan Robinson, who made the following statement “development is like the elephant, very difficult to define, but very easy to recognize” [1]. Thus, according to this author, the rupture between growth and economic development would only be possible if an alternative indicator to GDP per capita emerged. A fact, according to him, occurred when the United Nations - UN, through one of its organizational structures, the UNDP - United Nations Development Program, organized an immense collective effort that culminated in the creation of the HDI (Development Index) Human), which combines per capita income with the best health and education indicators. In this sense, it is worth highlighting the work of the Nobel Prize winner, Amartya Sen, in his work entitled “Development as freedom”, in which he reveals that there is a distinction between income inequality and economic inequality [2].

According to Santos et. al[3] this work by Amartya Sen calls into question the simplistic view that analyzed development only from the perspective of income, with a predominant view in the interpretations of the various schools of economic thought. Building on these same authors, Amartya Sen particularly focuses on the roles and interrelationships between certain instrumental freedoms that he considers crucial, including economic opportunity, political freedoms, social facilities, guarantees of transparency, and protective security. It also highlights, among other things, the mismatches observed between income and longevity in several countries [3]. In this way, the vision of development and sustainable development, contextualized here, walk exactly in the perspective of the complexity that goes far beyond that brought by a certain and unique indicator as a universal explanation factor of the degree of development. However, this is not intended

to be a standard model to be followed. We only signal a scientific path to better understand the scenario object of the present research, from a quantitative approach.

In this context, the Amazon reality was chosen as the scenario of the present study because this is the main region of biodiversity in the world and that there is an international attention in relation to economic activities in the perspective of sustainable development, which requires the government to carry out technical studies that can serve as a subsidy for the strategies and actions of the federal executive in the elaboration of effective public policies, which, among others, are the result of research that can shed light on the understanding and interpretation of the Amazon as an element of national economic integration. Thus, faced with such a scenario, Brazil created the policy of the Superintendence of the Manaus Free Zone (SUFRAMA) as a strategy to boost economic growth and regional development, without giving up environmental preservation and social justice.

Some questions arise that need to be answered: a) how to determine the level of regional development of municipalities in the Amazon based on the reality of SUFRAMA? b) how to carry out a comparative study between them and between other municipalities without access to such a policy? c) which indicators should be taken into account for this study? Thus, the epistemological problem raised in this study focuses on questioning whether the municipalities, objects of the present research, inserted in the Free Trade Areas contemplated by the SUFRAMA policy, present satisfactory socioeconomic aspects in terms of regional development, in comparison with the economic indicators and social aspects of municipalities not covered by the SUFRAMA policy, based on the theory of endogenous development and regional development poles associated with the institutionalist theory of Douglass North.

The hypotheses raised by the work, in turn, aimed to allow the construction of epistemological beacons and assumptions that allow conducting this work within the academic and scientific rigor. Thus, two hypotheses were raised in this study, namely: **H0**: If the economic and social development indices achieved by the municipalities in the LAC present a satisfactory performance and/or superior to the municipalities not served by the aforementioned policy, then it is understandable that the fiscal incentive policy linked to SUFRAMA has been giving positive results and deserves to be stimulated as a strategic and sustainable development path for the Amazon region, not implying, therefore, the need for intervention measures and adjustments of said public policy. **H1**: If, on the other hand, the economic and social development

indexes achieved by the LAC municipalities present an unsatisfactory performance and/or inferior to the municipalities not covered by the aforementioned policy, then the fiscal incentive policy linked to SUFRAMA deserves to be analyzed in a *in loco*, aiming to determine the bottlenecks and challenges inherent to the policy in question, indicating the need for adjustments and adaptations, in order to make it effective, effective and efficient.

Regarding the general objective, it consisted of analyzing, based on economic and social indicators, the degree of regional development of the 9 (nine) municipalities in the Amazon selected and covered by the tax incentives policy of the Manaus Free Trade Zone, linked to the Free Trade Areas, as well as other 9 (nine) municipalities in the western Amazon not covered by the aforementioned policy, based on quantitative data available from official sources, in order to understand the current situation of the regions selected in this study and discuss the effectiveness of this policy as a vector of regional development based on the theoretical foundations of the research.

Thus, given the context of economic globalization and the need to establish national policies to stimulate the development of regions with a significant presence of legally protected areas, such as the Brazilian Amazon and the Manaus Free Trade Zone policy, this work demonstrates its importance to the to analyze a regional context based on a vision of a pole of development inserted in a reality of economic freedom, which indicates the existence of an important paradox to be analyzed and discussed within science. With this, we seek to fill a fertile space in terms of analysis of regional economic development policies in the country, based on solid theoretical and methodological foundations capable of bringing light and contributions to the debates around this theme.

II. RESEARCH METHODOLOGY

2.1 TYPE OF SEARCH

This is a quantitative research of the experimental type, which will seek to raise indicators for later calculation of the index for purposes of comparison between the municipalities selected for this study.

2.2 UNIVERSE AND SAMPLE

Within the universe of 92 municipalities located on the border strip in the Brazilian Western Amazon [4], 9 municipalities covered by the Free Trade Areas policy were surveyed, namely: Tabatinga (Amazonas), Guajará-Mirim (Rondônia), Boa Vista and Bonfim (Roraima),

Macapá and Santana (Amapá) and Brasília, with extension to the municipality of Eptaciolândia, and Cruzeiro do Sul (Acre) and 9 more municipalities, for comparison purposes, not covered by the aforementioned policy, namely: Feijó, Sena Madureira and Tarauacá (Acre), Barcelos, Benjamin Constant and Boca do Acre (Amazonas) and Buritit, Nova Mamoré and Pimenta Bueno (Rondônia), totaling a sample of 18 municipalities along the border of the Western Amazon that participated in this study, with the years 2010 and 2018 being the two periods chosen for data collection. For this, the following acronyms of the municipalities selected in this work were adopted in order to facilitate the process of calculation and

presentation of data, as follows: Tabatinga (TAB), Guajará-Mirim (GUA), Boa Vista (BOA), Bonfim (BOM), Macapá (MAC), Santana (SAN), Brasília (BRA), Eptaciolândia, (EPI), Cruzeiro do Sul (CRU), Feijó (FEI), Sena Madureira (SEN), Tarauacá (TAR), Barcelos (BAR), Benjamin Constant (BEN), Boca do Acre (BOC) and Buritit (BUR), Nova Mamoré (NOV) and Pimenta Bueno (PIM).

2.3 DATA COLLECTION

The economic and social indicators collected from institutional sources are shown in Table 1 below.

Table 1: Initial survey of quantitative data for the preparation of the regional development index

THEME	INDICATORS	SOURCE
economic index	Gross Domestic Product per capita, at current prices (R\$ 1.00)	IBGE (Statistics)
	Share of gross value added at current prices of agriculture in the gross value added at current prices of agriculture in the federation unit (%)	IBGE (Statistics)
	Share of gross value added at current industry prices in gross value added at current industry prices in the federation unit (%)	IBGE (Statistics)
	Share of gross value added at current prices of services, administration, defence, education and public health and social security, in added value	IBGE (Statistics)
	Share of gross value added at current prices total in gross value added at current prices total of the federation unit (%)	IBGE (Statistics)
	Gross Domestic Product, at current prices (R\$ 1,000)	IBGE (Statistics)
	number of cattle	IBGE (Municipal livestock research)
	Rice production (% in relation to the state)	IBGE (municipal agricultural production)
	Coffee production (% in relation to the state)	IBGE (municipal agricultural production)
	Value of Production of Brazil Nuts (thousand BRL)	IBGE (Production of plant extraction and forestry)
Value of the production of round wood (Thousand BRL)	IBGE (Production of plant extraction and forestry)	
social index	Population served with water supply (%)	IBGE (demographic census)
	Unit No. Health (per thousand inhabitants)	DATASUS
	Number of beds (per thousand inhabitants)	DATASUS
	Number of doctors (per thousand inhabitants)	DATASUS
	IFDM Consolidated	Firjan

	IFDM Employment & Income	Firjan
	IFDM Education	Firjan
	IFDM Health	Firjan
	IDEB - Elementary school (early years)	INEP
	IDEB - Elementary school (final years)	INEP

Source: Own elaboration

Table 2: Survey of quantitative data effectively worked on for the preparation of the regional development index of the present study

THEME	INDICATORS	SOURCE
economic index	Gross Domestic Product per capita, at current prices (R\$ 1.00)	IBGE (Statistics)
	Share of gross value added at current prices of agriculture in the gross value added at current prices of agriculture in the federation unit (%)	IBGE (Statistics)
	Share of gross value added at current industry prices in gross value added at current prices of industry in the federation unit (%)	IBGE (Statistics)
	Share of gross value added at current prices of services, administration, defence, education and public health and social security, in added value	IBGE (Statistics)
	Participação do valor adicionado bruto a preços correntes total no valor adicionado bruto a preços correntes total da unidade da federação (%)	IBGE (Statistics)
	Gross Domestic Product, at current prices (R\$ 1,000)	IBGE (Statistics)
	number of cattle	IBGE (Municipal livestock research)
	Coffee production (% in relation to the state)	IBGE (municipal agricultural production)
	Value of the production of round wood (Thousand BRL)	IBGE (Production of plant extraction and forestry)
social index	Population served with water supply (%)	IBGE (demographic census)
	Unit No. Health (per thousand inhabitants)	DATASUS
	Number of beds (per thousand inhabitants)	DATASUS
	Number of doctors (per thousand inhabitants)	DATASUS
	IFDM Consolidated	Firjan
	IFDM Employment & Income	Firjan
	IFDM Education	Firjan
	IFDM Health	Firjan
	IDEB - Elementary school (early years)	INEP

Source: Own elaboration

2.4 DATA PROCESSING

This is a factor analysis study. The model in question follows the calculation reasoning proposed or

applied by Reis [5]; Hair et al [6]; Santana [7] and Santana [8]; Gama et al. [9]; Santana [10]; Fávoro and Belfiore [11]. This model has already been tested and applied in other studies, such as Cavalcante [12], Paraguassu-Chaves

et.at [13]; Paraguassu-Chaves et.at [14]; Paraguassu-Chaves et.at [15]; Paraguassu-Chaves et.at [16]; Paraguassu-Chaves et.at [17]; Paraguassu-Chaves et.at [18], where it was possible to build indexes within this methodological perspective. According to Hair et.al [6] factor analysis is a generic name given to a class of multivariate statistical methods whose main purpose is to define the underlying structure in a data matrix. Complementing this reasoning, the aforementioned authors also reveal that when summarizing the data, the factor analysis obtains latent dimensions that, when interpreted and understood, describe the data in a much smaller number of concepts than the original individual variables. The logic of construction of the social and economic indices, proposed here, therefore follows this reasoning.

These authors reveal that although there is still much debate about which factor model is the most appropriate, empirical research has shown similar results in many cases. Continuing with this reasoning, the authors state that in most applications, both principal component analysis and common factor analysis arrive at essentially identical results if the number of variables exceeds 30, or if the commonalities exceed 0.60 for most of the variables.

Therefore, factor analysis can identify the structure of a set of variables, as well as provide a process for data reduction [6]. In this study, we adopted the same methodological procedures already experienced by the authors in other research experiences. Thus, the factor analysis model adopted here is very similar to the principal components model, according to Santana [7] and Santana [8]. Also according to this author, the principal components model with m components and p variables ($q < p$), can be written based on the description presented by Dillon; Goldstein (1984), in which the model is presented in matrix form (Equation 1):

$$\begin{aligned} CP_1 &= Y_{11}X_1 + Y_{12}X_2 + \dots + Y_{1p}X_p \\ CP_2 &= Y_{21}X_1 + Y_{22}X_2 + \dots + Y_{2p}X_p \\ &\dots \\ CP_q &= Y_{q1}X_1 + Y_{q2}X_2 + \dots + Y_{qp}X_p \end{aligned}$$

Equation (1)

On what:

CP_i = are the i -th principal components ($i = 1, 2, \dots, q$);

$\square ij$ = are the coefficients related to each variable;

X_j = are the j th variables ($j = 1, 2, \dots, p$).

On the other hand, the basic model of factor analysis, according to Santana [7] and Santana [8], expresses each variable in terms of common latent factors and a single factor or specific factor. The algebraic representation of the model is given by equation 2:

$$\begin{aligned} X_1 &= \lambda_{11}FC_1 + \lambda_{12}FC_2 + \dots + \lambda_{1q}FC_q + \varepsilon_1 \\ X_2 &= \lambda_{21}FC_1 + \lambda_{22}FC_2 + \dots + \lambda_{2q}FC_q + \varepsilon_2 \\ &\dots \\ X_p &= \lambda_{p1}FC_1 + \lambda_{p2}FC_2 + \dots + \lambda_{pq}FC_q + \varepsilon_{mp} \end{aligned}$$

Equation (2)

$$X_p = \lambda_{p1}FC_1 + \lambda_{p2}FC_2 + \dots + \lambda_{pq}FC_q + \varepsilon_{mp}$$

On what:

X_i = are the i -th variables ($i = 1, 2, \dots, p$);

$\square ij$ = are the coefficients related to each common factor;

FC_j = are the j th common factors ($j = 1, 2, \dots, q$);

$\square i$ = are the i -th specific factors.

Thus, according to the author in question, the basic model of common factors is usually expressed in matrix form as in equation 3, according to Dillon; Goldstein [19]:

$$.X = \alpha F + \varepsilon \quad \text{Equation (3)}$$

Being,

X the **p-dimensional**, vector transposed of the observable = variables, denoted by $X = (x_1, x_2, \dots, x_p)$;

F the **q-dimensional**, vector transposed of unobservable = variables or latent variables called common factors, denoted by $F = (f_1, f_2, \dots, f_q)$, being that $q < p$;

ε the **p-dimensional** vector transposed of random variables = or single factors, denoted by $\varepsilon = (\varepsilon_1, \varepsilon_2, \dots, \varepsilon_p)$;

α the matrix (p,q) of unknown constants, called factor = loadings.

In the factor analysis process, an important aspect to be submitted to the data is the rotation of factors, through a factorial rotation tool, according to Hair e.al [6]. In practice, according to the same authors, the objective of all rotation methods is to simplify the rows and columns of the factor matrix to facilitate interpretation. Thus, it is assumed that in the factor analysis model the specific factors are orthogonal to each other, with all the common factors, where it is normally adopted that: $E(\varepsilon) = E(F) = 0$ and $Cov(\varepsilon, F) = 0$, according to Gama et.al., 2007 and Santana, 2007a. According to these authors, the initial structure used to determine the factor loading matrix, in general, may not provide a significant pattern of variable loadings, thus indicating that there is not something that signals a definitive way for this to occur. Thus, the confirmation or not of this initial structure can be done through various methods of factor rotation, according to Dillon; Godstein [19]; Johnson and Wichern [20]. For the purpose of the present construction of the regional development performance index, the VARIMAX method was adopted, considered one of the most popular methods

of orthogonal rotation of factors [6]. The VARIMAX method is a process in which the reference axes of the factors are rotated around the origin until some other position is reached. The objective is to redistribute the variance from the first factors to the others and reach a simpler and theoretically more significant factor pattern (HAIR et al [6]; SANTANA [7] and SANTANA [8]; GAMA et al [9]; SANTANA [21]; SANTANA[22].

The choice of factors, in turn, is performed using the latent root technique. According to Hair et.al.[6] latent root is the column sum of factor loadings squared for a factor. Also called eigenvalue, it corresponds to the amount of variance explained by a factor. According to these authors, a factor is understood to be the linear combination (statistical variable) of the original variables. The factors also represent the latent dimensions (constructs) that summarize or explain the original set of observed variables. Thus, the factor loading matrix that measures the correlation between common factors and observable variables is determined through the correlation matrix, according to Dillon; Goldstein[19]. Therefore, to determine the performance indices of economic and social development, we used the matrix of factor scores estimated by the factorial orthogonal rotation process, as pointed out by Santana[21]. The factor score, by definition, places each observation in the space of common factors. For each factor f_j , extracted factor score is defined by F_{ij} , expressed as follows (equation 4) [19]:

$$F_{ij} = b_1x_{i1} + b_2x_{i2} + b_px_{ip} \text{ Equation (4)}$$

Being that:

b_i = are the estimated regression coefficients for the n common factor regression matrix R .

x_{ij} = are the n observations of the p observable variables.

i = 1,2,...,n.

j = 1,2,...,p.

Gama et al [9] and Santana [22] show the evolutionary sequence of the formulas from the previous equation, which allows arriving at the equation that represents the regional development performance index of the municipalities object of the present study. Thus, according to the authors, it appears that although the variable F_{ij} is not observable, it can be estimated using factor analysis techniques, using the matrix of observations of the vector x of observable variables. In factorial notation, equation 5 becomes:

$$F_{(n,q)} = X_{(n,q)}b_{(p,q)} \text{ Equation (5)}$$

According to Santana[22], in equation 5, F is the regression matrix estimated from the n factor scores, which can be affected both by the magnitude and by the

measurement units of the x variables. To get around this type of problem, the variable x is replaced by the standardized variable w , (equation 6), given by the ratio between the deviation from the mean and the standard deviation of x , as follows:

$$w_{ij} = \text{Equation (6)}$$

With these values, equation 6 is modified making equation 7 possible, as follows:

$$F_{(n,q)} = w_{(n,q)}\beta_{(p,q)} \text{ Equation (7)}$$

Based on equation 7, the beta weight matrix (β) with q standardized regression coefficients, replaces b , given that the variables are standardized on both sides of the equation. Pre-multiplying both sides of equation 6 by the value $\frac{1}{n}w'$, where n is the number of observations and w' is the transposed matrix of w , makes it possible to arrive at equation 8 [22]:

$$\frac{1}{n}w'_{(p,n)}F_{(n,q)} = \frac{1}{n}w'_{(p,n)}w_{(n,p)}\beta_{(p,q)} = R_{(p,p)}\beta_{(p,q)} \text{ Equation (8)}$$

According to Santana[22]the matrix $\frac{1}{n}w'w$ it is constituted in the matrix of inter-correlated variables or matrix of correlation between the observations of the matrix x , designated by R . The matrix $\frac{1}{k}w'F$ represents the correlation between factor scores and the factors themselves, denoted by Λ . Thus, rewriting Equation 9, we have that:

$$\Lambda_{(p,q)} = R_{(p,p)}\beta_{(p,q)} \text{ Equation (9)}$$

The same author continues revealing that if the matrix R is non-singular, one can pre-multiply both sides of equation 10 by the inverse of R , obtaining:

$$\beta = R^{-1}\Lambda \text{ Equation (10)}$$

Thus, substituting the β vector in equation 4, we obtain the factor score associated with each observation (equation 11), as follows:

$$F_{(n,q)} = w_{(n,p)}R_{(p,p)}^{-1}\Lambda_{(p,q)} \text{ Equation (11)}$$

Thus, the main formula for the socioeconomic performance index (IDSE) of the municipalities studied is arrived at, from the perspective of the perception of regional development, which is defined as a linear combination of these factor scores and the proportion of variance explained by each factor in relation to the common variance. The mathematical expression is now represented by the following formula (equation 12), which was based on Santana[22]:

$$IDL_i = \sum_{j=1}^q \left(\frac{\lambda_j}{\sum_j \lambda_j} FP_{ij} \right) \text{ Equation (12)}$$

Where,

$i = 1, 2, \dots, n$.

$\lambda =$ the variance explained by each factor;

$\sum \lambda =$ the sum total of the variance explained by the set of common factors.

The factor score was standardized (FP) to obtain positive values from the original scores and allow the ranking of performances to be determined by the index in question, which ranges from 0 to 1. The formula that allows this hierarchy can be seen by equation 13:

$$FP_i = \text{Equation (13)}$$

It is thus seen that F_{min} e F_{max} are the maximum and minimum values observed for the factor scores associated with the performance of the socioeconomic development index (IDSE) from the perspective of the perception of regional development adopted for the present study.

With this, with multiple potential for use, due to the wide capillarity of studies linked to the interest in better understanding and analyzing, in practice, the theme of socioeconomic development and the scenarios of the local and regional reality around the Brazilian western Amazon region, which the analysis of economic and social indicators based on the multivariate method of data, using the technique of factor analysis and statistical tools from SPSS, allows the construction of a critical view of SUFRAMA's policy and its reflection in the perspective of regional development.

It is hoped, therefore, that this work can help in debates in terms of public policies for regional development, considering the economic and social focus as the axis of analysis. Thus, in the current scenario, where the issue of the Amazon has been more effectively demanded at the negotiation tables for the conclusion of bilateral or multilateral agreements in the spheres of economic and social integration, such as economic blocs, common markets, cooperation between countries, channel efforts to the field of academic debate, from the critical view applied to the process of understanding and interpreting the regional reality, its internal dynamics and the trend of its historical trajectory, thus allowing to build a clear and objective perception of the reality object of the present study, in order to bring new elements and new bases for discussion in the context of SUFRAMA's policy focused on aspects of economic and social development.

2.5 DATA ADEQUACY CRITERIA FOR FACTOR ANALYSIS

According to Santana[22], the two main tests that assess data adequacy for factor analysis are the Bartlett sphericity tests, which assess the general significance of the correlation matrix, that is, it tests the null hypothesis that the correlation matrix correlation is an identity matrix;

and the Kaiser-Meyer-Olkin (KMO) test, which is based on the principle that the inverse of the correlation matrix approximates the diagonal matrix, in order to compare the correlations between the observable variables. Such models can be expressed in mathematical formulas. Said mathematical formulas of these tests are based on Dillon; Goldstein [19]; Reis [5], Santana [22].

a) Bartlett's test

According to Santana [22], in particular, the Bartlett test of sphericity tests the null hypothesis that the variables are independent, against the alternative hypothesis that the variables are correlated with each other, as can be represented as follows, according to the said author:

$$H_0: R = I \text{ ou } H_0: \lambda_1 = \lambda_2 = \dots = \lambda_p, \text{ (Equation 14)}$$

and is given by:

$$X^2 = - \left[n - 1 - \frac{1}{6} (2p + 5) \right] \cdot \ln |R| \text{ (Equation 15)}$$

ou

$$X^2 = - \left[n - 1 - \frac{1}{6} (2p + 5) \right] \cdot \sum_{i=1}^p \lambda_i \text{ (Equation 16)}$$

On what:

$|R|$ is the determinant of the sample correlation matrix;

λ is the variance explained by each factor;

n is the number of observations; and

p is the number of variables.

The statistic has an asymptotic distribution of χ^2 com $[0,5.p.(p-1)]$ degrees of freedom.

b) Kaiser-Meyer-Olkin (KMO) test

The mathematical formulas for these tests were based on Dillon; Goldstein [19], Reis [5], according to Santana [22]:

$$KMO = \frac{\sum_i \sum_j r_{ij}^2}{\sum_i \sum_j r_{ij}^2 + \sum_i \sum_j a_{ij}^2} \text{ (Equation 17)}$$

On what:

r_{ij} is the sample correlation coefficient between variables x_i and x_j ;

a_{ij} is the partial correlation coefficient between the same variables that is, simultaneously, an estimate of the correlations between the factors, eliminating the effect of the other variables.

The a_{ij} should assume values close to zero, since the factors are assumed to be orthogonal to each other. Values of this test below 0.5 are unacceptable [6].

e) Commonality

In addition to the two previous tests, there is also commonality as an important criterion for testing the suitability of data for factor analysis. In this sense, commonality is the proportion of common variance present in a given variable. Thus, on a scale of zero to one, a variable that does not present specific variance or error would have a commonality of 1, while a variable that does not share variance with any other variable would have a commonality of value 0. In general, the literature indicates a minimum value of 0.5 for commonality to be considered satisfactory. Therefore, for a variable to work well in a factor analysis, it needs to have a large proportion of common variance (HAIR et.al [6]; MATOS and RODRIGUES [23]). In the specific case of this study, the cumulativeness met the requirements for factor analysis.

2.6 SCALE ADOPTED FOR ANALYSIS OF SOCIAL AND ECONOMIC INDICES

Below is table 3, which illustrates the description of the scale adopted for this study.

Table 3: Index scale and description

Scale	Description
0.801 to 1.000	Very high
0,601 to 0,800	High
0,401 to 0,600	Regular
0,201 to 0,400	Weak
< 0,200	Very weak

Source: Authors

III. DATA ANALYSIS AND DISCUSSION

3.1 Determination of the economic index of municipalities with SUFRAMA: 2010 and 2018

The economic development index for the municipalities assisted by the SUFRAMA policy in 2010. The highest rates found corresponded to the municipalities of Macapá (0.717) and Boa Vista (0.652), capitals of the States of Amapá and Roraima, respectively. Next, the municipality of Brasília (Acre) presented an index of 0.307, followed by the municipality of Santana (Amapá) of 0.239. The other municipalities presented indexes below 0.200, which here was classified as having very low performance.

In 2018, the economic development index was higher in Boa Vista (Roraima) with an index of 0.713 and in Macapá (Amapá) with an index of 0.626, followed by Brasília (Acre) with 0.319, Bonfim (Roraima) with 0.243 and Epitaciolândia (Acre) with 0.224, and the other

municipalities presented performances below 0.200. The municipality with the highest growth rate in the IDEC in the period in question were the municipalities of Bonfim (Roraima) with 57.3% growth, Epitaciolândia (Acre) with 35.4% and Guajará-Mirim (Rondônia) with 13.1%. The municipalities that presented the highest negative growth rates were: Santana (Amapá) with -21.3% and Macapá (Amapá) with -12.8%.

3.2 Determination of the social index of municipalities with SUFRAMA: 2010 and 2018

From the point of view of social development based on the year 2010, the two capitals continue to stand out in relation to the other municipalities assisted by the SUFRAMA policy, with Macapá (Amapá) reaching an index of 0.581 and Boa Vista (Roraima) of 0.580. Next, in descending order, come the municipalities of Santana (Amapá) and Brasília (Acre), which reached, respectively, social development indices of 0.402 and 0.388. Then, also in descending order, are the municipalities of Cruzeiro do Sul (Acre) with 0.319; Guajará-Mirim (Rondônia) with 0.310; Epitaciolândia (Acre) with 0.303; Bonfim (Roraima) with 0.258 and Tabatinga (Amazonas) with an index below 0.200.

According to the IDSO results for the year 2018 in relation to the municipalities assisted with the SUFRAMA policy, the highest IDSO was observed in the municipality of Boa Vista (Roraima) with a performance of 0.700. Next come the municipalities of Cruzeiro do Sul (Acre) with 0.508; Brasília (Acre) with 0.487; Macapá (Amapá) with 0.447; Guajará-Mirim (Rondônia) with 0.373; Epitaciolândia (Acre) with 0.342; Tabatinga (Amazonas) with 0.338; Bonfim (Roraima) with 0.322; Santana (Amapá) with 0.319.

From the point of view of growth in the analyzed period (IDSO-2010 and IDSO-2018), it appears that only 22.2% of the municipalities assisted by the SUFRAMA policy had negative growth rates and this reality was observed exclusively in the municipalities of Amapá participating in this study, where the municipality of Macapá presented a rate of -23.0% and Santana with -20.7% of growth in the period. The other municipalities showed positive growth rates, especially Tabatinga (Amazonas) which achieved the highest growth rate in the period (222.6%). The others showed the following growth rates, in descending order, Cruzeiro do Sul (Acre) = 59.3%, Bonfim (Roraima) = 35.1%, Boa Vista (Roraima) = 20.7%, Guajará-Mirim (Rondônia) = 20.6% and Epitaciolândia (Acre) = 12.9%.

3.3 Determination of the economic index of municipalities without SUFRAMA: 2010 and 2018

The IDEC of the municipalities that are not assisted by the SUFRAMA policy reached a performance considered "low" for 40% of them and "very low" for the other 60%. In descending order, the performance found follows the following sequence: Pimenta Bueno (Rondônia) = 0.329, Sena Madureira (Acre) = 0.229. The other municipalities presented results below 0.200.

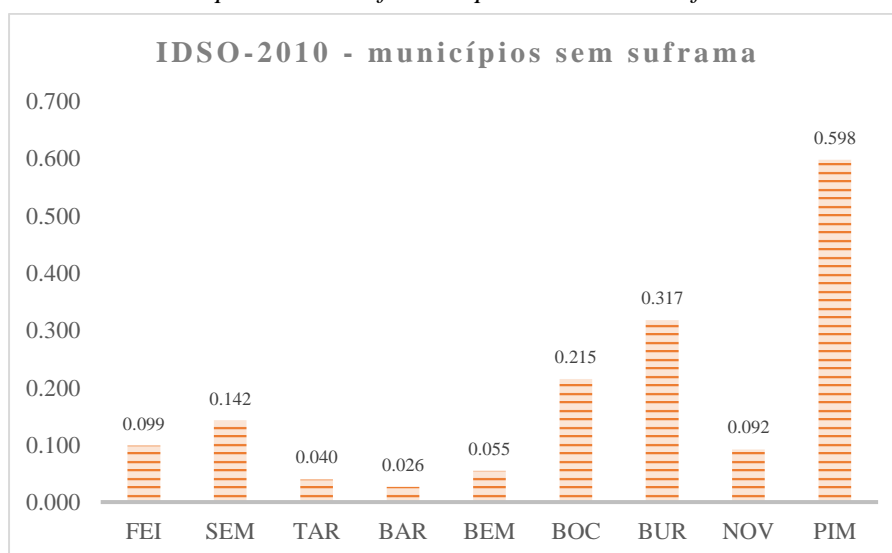
The distribution of performances in 2018 followed practically the same trends observed for 2010. Thus, in descending order, the performance of IDEC 2018 corresponded to the following sequence: Pimenta Bueno (Rondônia) = 0.326, Buritis (Rondônia) = 0.283, Nova Mamoré (Rondônia) = 0.248 and Sena Madureira (Acre) = 0.202. The other municipalities presented results below 0.200.

Thus, these results allow analyzing the growth rate in the period in question, that is, between 2010 and 2018, in relation to the IDEC. As a result, a negative growth rate was observed in 60% of the municipalities, namely: Barcelos (Amazonas) = -100%, Benjamin Constant (Amazonas) = -42.1%, Sena Madureira (Acre) = -11, 9%, Tarauacá (Acre) = -2.8% and Pimenta Bueno (Rondônia) = -0.9%. On the other hand, the other municipalities showed positive growth rates, namely: Boca do Acre (Acre) = 179.1%, Feijó (Acre) = 13.1%, Buritis (Rondônia) = 7.7% and Nova Mamoré (Rondonia) = 5.4%.

3.4 Determination of the social development index of municipalities without SUFRAMA: 2010 and 2018

Graph 1 illustrates the results of the IDSO-2010 for the municipalities without SUFRAMA surveyed.

Graph 1: Social development index of municipalities without Suframa: 2010

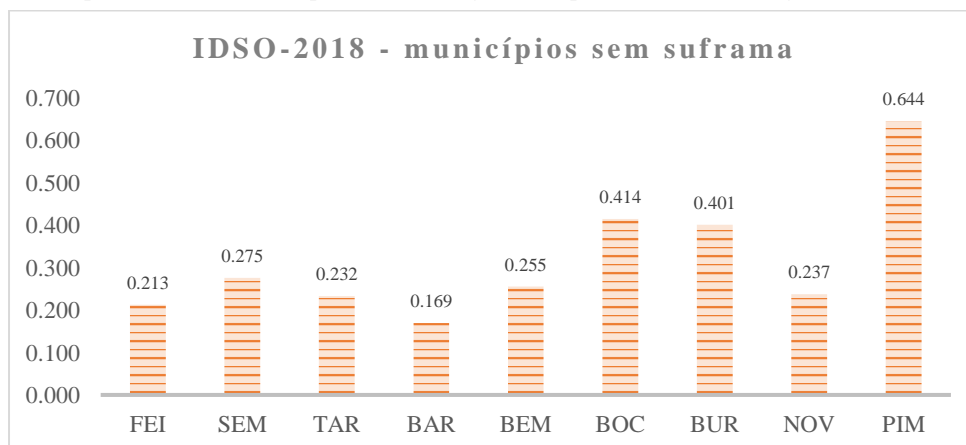


Source: Determined by research.

The IDSO - 2010 for the municipalities without SUFRAMA, illustrated by graph 1, with the exception of the municipality of Pimenta Bueno (Rondônia) which achieved the highest performance among the other municipalities, however with a scale level classified as "regular" performance, when reaching the IDSO of 0.598, corresponding to approximately 10% of the representation of the municipalities, indicates a scenario of either very low performance, as was the case of almost all municipalities in this performance range, that is, approximately 70% of them, or of low performance , for

the remaining 20% of the municipalities (Graph 2). Thus, the municipalities with low performance were: Buritis (Rondônia) = 0.317 and Boca do Acre (Amazonas) = 0.215. The municipalities with very low performance, in descending order, were: Sena Madureira (AC) = 0.142, Feijó (Acre) = 0.099, Nova Mamoré (Rondônia) = 0.092, Tarauacá (Acre) = 0.040 and Barcelos (Amazonas) = 0.026 . Graph 2 presents the results of the social development index for the year 2018 for the municipalities not covered by the SUFRAMA policy.

Graph 2: Social development index of municipalities without Suframa: 2018



Source: Determined by research.

Chart 2 shows a trend in the behavior of the results similar to that shown in the previous chart, which corresponded to 2010 data. Thus, in descending order, it is noted that the highest performance was achieved by the municipality of Pimenta Bueno (Rondônia) with 0.644, followed by the municipalities of Boca do Acre (Amazonas) with 0.414, Buritis (Rondônia) with 0.401, Sena Madureira (Acre) with 0.275, Benjamin Constant (AM) with 0.255, Nova Mamoré (Rondônia) with 0.237,

Tarauacá (Acre) with 0.232 and Feijó (Acre) with 0.213. The municipality of Barcelos (Amazonas) was the only one to have a performance below 0.200 in this analysis.

Table 4 presents all the results found for the social and economic indices for the years 2010 and 2018, along with the respective growth rates observed in the period.

Table 4: Socioeconomic indices determined by the survey for the municipalities surveyed for the years 2010 and 2018 and the growth rates in the period.

Municipalities	IDSO-2010	IDSO-2018	Growth rate %	IDEC-2010	IDEC-2018	Growth rate
TAB	0,105	0,338	222,6	0,024	0,023	-4,8
GUA	0,310	0,373	20,6	0,116	0,131	13,1
BOA	0,580	0,700	20,7	0,652	0,713	9,3
BON	0,238	0,322	35,1	0,154	0,243	57,3
MAC	0,581	0,447	-23,0	0,717	0,626	-12,8
SAN	0,402	0,319	-20,7	0,239	0,188	-21,3
BRA	0,388	0,487	25,4	0,307	0,319	3,7
CRU	0,319	0,508	59,3	0,169	0,166	-2,1
EPI	0,303	0,342	12,9	0,166	0,224	35,4
FEI	0,099	0,213	115,7	0,112	0,126	13,1
SEN	0,142	0,275	93,5	0,229	0,202	-11,9
TAR	0,040	0,232	487,2	0,125	0,121	-2,8
BAR	0,026	0,169	542,9	0,015	0,000	-100
BEN	0,055	0,255	367,1	0,023	0,013	-42,1

BOC	0,215	0,414	92,9	0,063	0,176	179,1
BUR	0,317	0,401	26,3	0,263	0,283	7,7
NOV	0,092	0,237	157,7	0,235	0,248	5,4
PIM	0,598	0,644	7,7	0,329	0,326	-0,9

Source: Search result..

Subtitle:

	Municipalities WITH SUFRAMA
	Municipalities WITHOUT SUFRAMA

Based on this table, it was possible to organize the results found for the IDEC and IDSO indexes grouped in the two groups of municipalities studied in this study: with SUFRAMA and without SUFRAMA.

Thus, associating the respective indices with the scale adopted in this study, tables from 5 to 6 were

Table 5: Classification of municipalities with SUFRAMA according to the scale of this research based on the social index.

Scale	Description	IDSO-2010	IDSO-2018
0,801 – 1,000	Very high	-	-
0,601 – 0800	High	-	BOA
0,401 – 0,600	Regular	BOA, MAC, SAN	MAC, BRA, CRU
0,201 – 0,400	Weak	GUA, BOM, BRA, CRU, EPI	TAB, GUA, BOM, SAN, EPI
<0,200	Very weak	TAB	-

Source: Search result.

The municipalities of Boa Vista (Roraima), Macapá (Amapá) and Santana (Amapá), in 2010, reached the same level of performance, classified as “regular”. The municipalities of Guajará-Mirim (Rondônia), Bonfim (Roraima), Brasiléia (Acre), Cruzeiro do Sul (Acre) and Epitaciolândia (Acre) achieved a performance considered weak in this study. O pior desempenho foi registrado para o município de Tabatinga (Amazonas) que teve um desempenho muito ruim. In 2018, the situation improves for the municipality of Boa Vista (Roraima), which achieves a performance considered “high”. The municipality of Macapá (Amapá) remains at the same performance level as it was in 2010, that is, it remains at the “regular” level of performance in 2018. The

prepared with the objective of distributing the results found by the cities surveyed according to the parameters adopted. Table 5, in turn, deals with the IDSO-2010 and IDSO-2018 for the municipalities assisted by the SUFRAMA policy.

municipality of Santana (Amapá) also recorded a drop in the period from 2010 to 2018, going from a “regular” performance to a “poor” performance in the last year of analysis. With the exception of the municipality of Cruzeiro do Sul (Acre), which rose in the performance category in 2018, upon reaching the high performance scale, all other municipalities that had a “poor” performance in 2010 remained in the same performance range in the year 2018. Added to this list of municipalities with poor performance was the municipality of Tabatinga (Amazonas), which in the previous year had a performance considered very weak (Table 5).

Table 6 deals with the IDEC-2010 and IDEC-2018 for the municipalities covered by the SUFRAMA policy.

Table 6: Classification of municipalities with SUFRAMA according to the scale of this research based on the economic index.

Scale	Description	IDEC-2010	IDEC-2018
0,801 – 1,000	Very high	-	-
0,601 – 0800	High	BOA, MAC	BOA, MAC
0,401 – 0,600	Regular	-	-
0,201 – 0,400	Weak	SAN, BRA	BOM, BRA, EPI
<0,200	Very weak	TAB, GUA, BOM, CRU, EPI	TAB, GUA, SAN, CRU

Source: Search result.

From table 6 it is possible to observe that the municipalities of Boa Vista (Roraima) and Macapá (Amapá) remained in the same high performance category of the IDEC in both analyzed years, no municipality was observed in the category of very high or regular performance. In 2010, only the municipalities of Santana (Amapá) and Brasilândia (Acre) had regular performance. However, in 2018, only Brasilândia (Amapá) remains in this category, along with the municipalities of Bonfim (Roraima) and Epitaciolândia (Acre) that increased in

performance, since in 2010 both municipalities were in the range of very poor performance. Thus, in 2018, the municipality of Santana (Amapá) falls into the range of very poor performance, in addition to the municipalities of Tabatinga (Amazonas), Guajará-Mirim (Rondônia) and Cruzeiro do Sul (Acre) that remained at this level of very poor performance in the period from 2010 to 2018.

Tables 7 and 8 refer to municipalities not covered by the SUFRAMA policy for IDS0 2010-2018 and IDEC 2010-2018, respectively.

Table 7: Classification of municipalities without SUFRAMA according to the scale of this research based on the social index.

Scale	Description	IDSO-2010	IDSO-2018
0,801 – 1,000	Very high	-	-
0,601 – 0800	High	-	PIM
0,401 – 0,600	Regular	PIM	BOC, BUR
0,201 – 0,400	Weak	BOC, BUR	FEI, SEM, TAR, BEM, NOV
<0,200	Very weak	FEI, SEM, TAR, BAR, BEM, NOV	BAR

Source: Search result.

In relation to table 7, it is possible to observe, with the exception of the municipality of Barcelos (Amazonas) which remained in the same category of very poor performance in the two years surveyed, the other municipalities rose in performance category in the period from 2010 to 2018. Thus, the municipality of Pimenta Bueno (Rondônia), which was in the regular performance range in 2010, moves to the high performance category in

2018. In the same way that the municipalities of Boca do Acre (Amazonas) and Buritis (Rondônia) that were in the low performance range in 2010 reach, in 2018, the regular performance range. And the municipalities of Feijó (Acre), Sena Madureira (Acre), Tarauacá (Acre), Benjamin Constant (Amazonas) and Nova Mamoré (Rondônia), which were in the range of very poor performance in 2010, moved up to the range of weak performance in 2018.

Table 8: Classification of municipalities without SUFRAMA according to the scale of this research based on the economic index.

Scale	Description	IDEC-2010	IDEC-2018
0,801 – 1,000	Very high	-	-
0,601 – 0800	High	-	-
0,401 – 0,600	Regular	-	-
0,201 – 0,400	Weak	SEM, NOV, PIM, BUR	SEM, NOV, PIM, BUR
<0,200	Very weak	FEI, TAR, BAR, BEM, BOC	FEI, TAR, BAR, BEM, BOC

Source: Search result.

Table 8, in turn, illustrates the result for the performance of the economic development index for the municipalities not covered by the SUFRAMA policy. Based on this table, it is possible to observe that the two scenarios inherent to the performance of IDEC-2010 and IDEC-2018, there was no change in the period. Thus, the municipalities of Sena Madureira (Acre), Nova Mamoré (Rondônia), Pimenta Bueno (Rondônia) and Buritis (Rondônia), which were in the low performance range in 2010, remained in the same range in 2018. Likewise, the municipalities of Feijó (Acre), Tarauacá (Acre), Barcelos (Amazonas), Benjamin Constant (Amazonas) and Boca do Acre (Amazonas) remained in the range of very poor performance for the two analyzed periods. In this way, it can be seen that there was a concentration of municipalities in the range of "weak" or "very weak" performance for the year 2010 and 2018, unchanged.

Municipalities of Macapá (Amapá) and Boa Vista (Roraima) compare themselves in comparison with other surveyed municipalities present the highest social and economic performances for the year 2010. Pimenta Bueno (Rondônia) also stands out for presenting a relatively high social index, the other municipalities surveyed had average performances with a tendency to weak or very poor performance for the two indexes surveyed, considering the scale adopted in this work.

The results point to the high performance of the municipalities of Boa Vista (Roraima) and Macapá (Amapá) for the IDEC-2018 and the high performance of the IDSO-2018 for the municipalities of Boa Vista (Roraima) and Pimenta Bueno (Rondônia). In view of this context, the other municipalities were distributed in a range either with regular performance or with weak and very poor performance, in general.

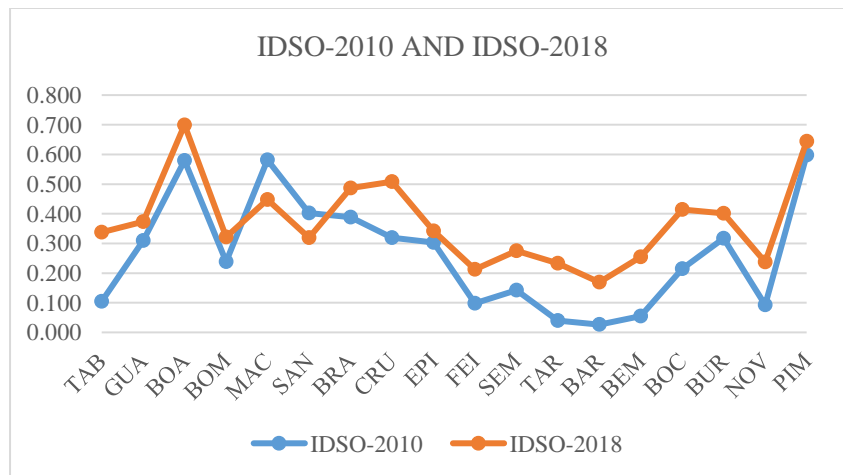
Thus, analyzing the data presented so far, the complex reality of the Amazonian municipalities calls attention, which, not infrequently, tends to demonstrate a scenario that still lacks a regional development process that can in fact lead to a perspective of institutional

change, according to North[24] and that, therefore, can lead them to new trajectories, to new scenarios, to new levels. However, what is evident in this work is that although there is a certain dynamic among the cities surveyed, in general, such dynamics are located at a critical level, where the signal is alarmed. This indicates that there is a need for greater attention from the government as an agent of change through public policies, within a context of endogenous or local development. However, there is another aspect that has not been researched, but that is essential for such a change to occur. It is about social capital as a collective mechanism for the convergence of forces, in order to enhance what there is of aptitude in the region, within an internal social perspective based on the context of endogenous development.

Such results indicate that development is still something difficult to be perceived within the Amazon regional context. Thinking about the Amazon with its peculiarities and complexities is the best way to go. However, in general terms, this is not what happens in practice. And the result ends up producing scenarios with multiple variables that end up interfering in some way in the local and regional dynamics. Understanding and interpreting such a complex reality is the challenge that continues to be projected in time and space, owing, even, to the economy, the challenge of contributing to the explanation of the phenomena that tend to have increasingly complex behaviors of reality. For this, it is necessary to find orthodox and/or heterodox economic forms of development capable of pulling up this scenario observed by the surveyed municipalities, which still tend to rest their dynamics on the lowest levels of development, with reflections, including, on the quality of local and regional life.

Graph 3, below, illustrates the results found for the IDSO-2010 and IDSO-2018 for all the municipalities surveyed. Based on it, it is possible to verify a certain improvement in the social development index, both for 2010 and 2018.

Graph 3: Social performance index of the surveyed municipalities.

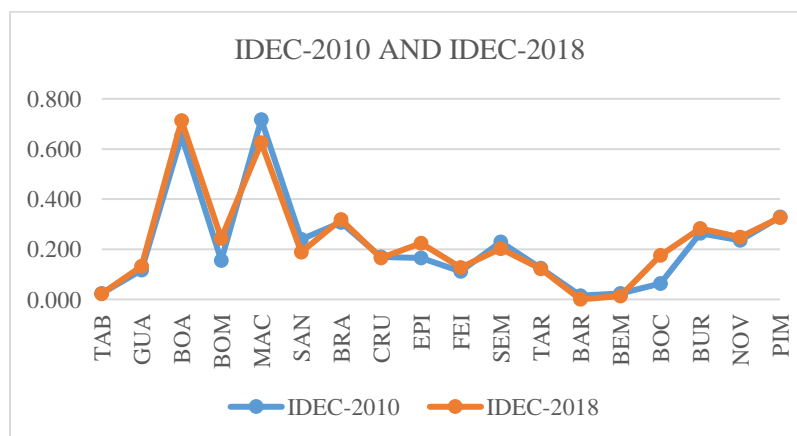


Source: Search result.

Thus, it can be seen from graph 3 that 70% of the municipalities assisted by the SUFRAMA policy showed improvements in their performance from 2010 to 2018 and, in the same way, 100% of the municipalities not

served by this policy had their rates improved from 2010 to 2018. Graph 4, in turn, concerns IDEC-2010 and IDEC-2018.

Graph 4: Economic performance index of the surveyed municipalities.



Source: Search result.

Based on this graph, it appears that there was almost no change in performance in the two years surveyed. However, 50% of the municipalities assisted by the SUFRAMA policy had a small and slight improvement in 2018 when compared to 2010. Regarding the municipalities without SUFRAMA, it was observed that approximately 30% of the municipalities had a slight improvement in performance. Aiming to obtain new perspectives of analysis, tables 9 and 10 were constructed

that deal with the distribution and frequency of the indexes for a certain level of scale for the municipalities with SUFRAMA and without SUFRAMA, respectively. It can be observed that 66.7% of the municipalities served by SUFRAMA that participated in this research presented “weak” and “very weak” performance for the social development index for the year 2010. For 2018 this index was even higher, reaching 77.8% with low performance level.

Table 9: Distribution and relative frequency of the socioeconomic indices of the municipalities WITH SUFRAMA determined by the survey.

Scale	Description	IDSO-2010		IDSO-2018		IDEC-2010		IDEC-2018	
		qde	%	qde	%	Qde	%	qde	%
0,801 – 1,000	Very high	-	-	-	-	-	-	-	-
0,601 – 0,800	High	-	-	1	11,1	2	22,2	2	22,2
0,401 – 0,600	Regular	3	33,3	3	33,3	-	-	-	-
0,201 – 0,400	Weak	5	55,6	5	55,6	2	22,2	3	33,3
> 0,200	Very weak	1	11,1	-	-	5	55,6	4	44,5
Total	-	9	100%	9	100%	9	100%	9	100%

Source: Search result.

Although the SUFRAMA policy is a reality for these municipalities, it is noticeable from the data and indices analyzed that such a scenario could be even worse if such a policy did not exist. This allows us to point out that it is not simply a matter of denying the importance of the aforementioned regional development policy, but of stating that there is a need to redirect the strategic focus so that SUFRAMA's policy can be felt more strongly by society in general, especially those residing in local level

In this sense, it is worth noting, in general, the fact that the taxes generated by economic activities in these municipalities assisted by the policy of influence of the Manaus Free Trade Zone are normally directed to the

federal government treasury, with no possibility of part of this amount being applied in the region covered by the said policy. Thus, the return of part of these values transferred to the treasury to be applied in local public policies seems to us to be a fair measure for strategic planning in favor of local and endogenous development. Thus, strengthening the internal social capital and the natural vocation of these regions that could focus their planning in favor of actions that aim to guarantee greater investments in infrastructure, health, education, etc. In relation to the municipalities unassisted by the SUFRAMA policy, the result was even worse. (Table 10).

Table 10: Distribution and relative frequency of socioeconomic indices of municipalities WITHOUT SUFRAMA determined by the survey.

Scale	Description	IDSO-2010		IDSO-2018		ÍDEC-2010		ÍDEC-2018	
		qde	%	qde	%	qde	%	qde	%
0,801 – 1,000	Very high	-	-	-	-	-	-	-	-
0,601 – 0,800	High	-	-	1	11,1	-	-	-	-
0,401 – 0,600	Regular	1	11,1	2	22,2	-	-	-	-
0,201 – 0,400	Weak	2	22,2	5	56,6	4	44,4	4	44,4
> 0,200	Very weak	6	66,7	1	11,1	5	55,6	5	55,6
Total	-	9	100%	9	100%	9	100%	9	100%

Source: Search result.

In this sense, 88.9% of these municipalities were at the “weak” and “very weak” level of development, both in 2010 and 2018. Regarding the economic development index for the year 2010, it was observed that 100% of the

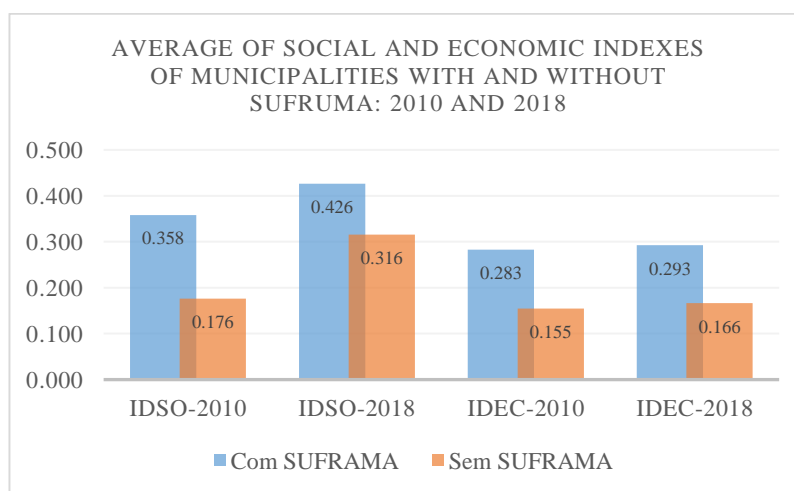
municipalities presented “weak” and “very weak” performances for both 2010 and 2018.

Although these results have been reached, further research and deeper analysis is necessary due to the multiple variables that may be acting and interfering in the

dynamics observed in this study. Anyway, the present study signals a worrying scenario in terms of regional development, seen here based on economic and social indices, which allows new abstractions regarding the Brazilian Amazon region. By taking the average of the indexes between the municipalities with SUFRAMA and without SUFRAMA, with the objective of verifying, in a comparative way, the two samples of municipalities surveyed, we arrive at graph 5.

From this graph, it is possible to notice that in all scenarios the average of the indices presented by the

Graph 5: Average of social and economic indexes of municipalities with and without SUFRAMA: 2010 and 2018.



Source: Search result.

This analysis is important because it demonstrates that the economic issue is reflected in the social issue and vice versa. This analysis is in line with the thought of North[24], where social culture, built on the basis of a historical perspective, has a strong relationship with the development process of a region. Putnam[25] demonstrated this aspect when studying the reality of Italy for 20 years and found the power of social capital and its reflection on citizenship and the degree of development of Italian regions that occurred differently due to differences in traditions and culture. This aspect in the Amazon was worked on by Cavalcante[12] where he found that in Rondônia there are two historical scenarios that produced two very different societies in Rondônia, with different cultures and that this has influenced the dynamics of regional development to the point of demonstrating that social capital it is a factor that has interfered with intensity for the status quo of these regions in a differentiated way, each one in its dynamics and in its rhythm.

Thus, the starting point for a better understanding of this dynamic is the historical-economic formation of these regions, in order to allow a better critical analysis of the culture and its respective processes

municipalities with SUFRAMA exceed the average of the municipalities without SUFRAMA. The fact that the capitals of Roraima and Amapá are participating in this sample of municipalities, in some way, may have contributed to this scenario. However, this does not preclude the results found, which showed some coherence with the reality in question. This observation serves so that future studies can analyze this aspect in order to corroborate or not with the results achieved here.

of endogenous development. Corroborating with the thought of North[24] where the social is the basis for understanding the dynamics or stagnation of an economy, that is, the economic is not the cause but a consequence of a certain institutional arrangement built by the social force of the place, it allows to trace new future perspectives of studies in the field of social capital as a means to understand, from the historical trajectory, the present scenario and, from it, the future of the region. In view of this, studies in this direction prove to be quite fertile to understand the Amazon scenario and its peculiarities materialized in its multiple variables that normally escape the context of the everyday national scenario of large urban-industrial centers. Understanding such dynamics involves expertise and requires methodological instruments capable of dealing with a complex reality such as, in general, the regions inserted in the Brazilian Amazon context.

IV. FINAL CONSIDERATIONS

The research brought as a challenge to analyze the reality of Amazonian municipalities based on economic

and social indicators in order to determine the regional development index and, from there, analyze the degree of performance achieved by the municipalities assisted with the regional development policy linked to the context of the SUFRAMA policy in comparison with municipalities that were not contemplated with the aforementioned public policy in order to analyze its effect from the perspective of economic and social development.

The use of the quantitative method with the use of factor analysis allowed the impartial character of the research, since all the procedures performed in this work strictly followed the methodological procedures, thus avoiding any possibility of imposing or influencing a trend in the behavior of the data. Only after the construction of the indices and procedures that led to their systematization that make it possible to have the necessary conditions to analyze the results found.

In general, a low level of economic and social development of the surveyed municipalities was evidenced, indicating a reality that goes through challenges that need to be overcome and focused on the local reality in an integrated way to the national context such as logistics, infrastructure, health, education and aspects economic and socio-environmental issues as the main axis of strategic vision to overcome such a regional challenge. Such results can, in the first place, serve as a counterpoint to the main reason for maintaining the SUFRAMA policy in the region. However, the fact that this scenario of weak or very weak regional development observed in the municipalities that participated in this study, including the municipalities that are not assisted by the SUFRAMA policy, allows us to conclude, therefore, that this is a reality faced in the Amazon region as a whole, and that, therefore, should be the object of future research, in order to determine which factors contribute to this scenario, which may require other statistical methods used in the multivariate analysis of data, such as multiple regression, among other available models and applicable to specific cross-sectional data sets or time series or a combination of both.

On the other hand, based on the *ceteris paribus* concept, an analysis can be made from the endogenous point of view of SUFRAMA's regional development policy based on the indices and results found in this study. In this way, it was evident that even with performances, in general, depressing in terms of the performance of IDEC and IDSO, especially in the municipalities assisted by the aforementioned policy, even so it is still necessary for the development of the region, in view of many of these municipalities, characterized by being significantly limited by nature conservation units and indigenous lands that end

up, in some way, limiting productive areas, which strengthens the maintenance of the SUFRAMA policy as an alternative strategic action in search of sustainable development of these regions, in particular, and the Western Amazon more generally. In addition, it was shown that even with low levels of economic and social development in this study, the municipalities covered by the SUFRAMA policy presented a slightly better scenario compared to those not covered by this federal government policy, showing some type of influence of this policy in the local reality.

From the point of view of the growth pole theory and the economic development pole brought by Perroux, it is clear that it was not possible to observe the effects of this reality in the municipalities covered by the SUFRAMA policy and which participated in this study. Even so, it is clear that the scenario could be more serious if such a policy did not exist in the respective regions. Perhaps therein lies the biggest problem of this policy in not having yet managed to produce a prosperous and autonomous environment of endogenous development, which seems to impact the way of seeing the aforementioned policy not as an element of change in the local and regional reality, but as a welfare policy, generating behavior dependent on government actions that ends up contributing in some way to low social capital, human capital and, consequently, the impact of this behavior on the culture of the place. Although it is an aspect perceived in this study in an abstract way, there is a need for further studies within this perspective. Within a view of contributing to greater effectiveness of SUFRAMA's policy, the issue of distribution of resources collected from taxes generated by the economic activities of the place can be mentioned. This is because the current model indicates that all resources from taxes paid by companies installed and collected by the government basically present a one-way path, with a one-way path to the national treasury coffers and not in a two-way context, with a sense also back to the municipal coffers. In this sense, an observation is made on this aspect that, in our view, could positively impact the development of these regions covered by the aforementioned policy.

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